

REMARKS

Claims 12-23 are pending in this application. By this Amendment, claims 1-11 are canceled without prejudice or disclaimer; and claims 12-23 are added. Support for new claims 12-23 can be found at least in Figs. 10 and 13, and the corresponding disclosure in the specification. No new matter is added.

Claims 12-23 address the issues raised in the February 25 Notice of Non-Compliant Amendment.

The Office Action rejects claims 1, 3, 4, 10 and 11 under 35 U.S.C. §102(b) over Nomura (U.S. Patent No. 5,933,189); and rejects claims 2 and 5-9 under 35 U.S.C. §103(a) over Nomura. The rejections are respectfully traversed.

Nomura fails to teach and would not have rendered obvious the claimed combination of features recited in independent claim 12. Nomura fails to teach and would not have rendered obvious "a second switch, a third switch and a fourth switch respectively applying first, second and third independent voltages to a second gate of the second transistor," as recited in independent claim 12.

The Office Action asserts that it would have been obvious to duplicate the PD-QT pair and/or the QP-VP pair of Nomura and provide signals that are appropriate for multiplexing (see pages 4 and 5 of the Office Action). However, in Nomura, a PD-QT pair and a QP-VP pair are individually provided in each pixel. One of ordinary skill would not have been motivated to provide additional PD-QT or QP-VP pairs within the same pixel. Accordingly, it would not have been obvious to provide a fourth switch for applying a third independent voltage to a second gate of a second transistor, as recited in independent claim 12.

In Nomura, all pixels within a column are connected to the same sample and hold circuit CSH. Accordingly, duplicating either PD-QT pairs or QP transistors would significantly interfere with the addressing scheme of the image apparatus and would thus

deter one of ordinary skill from making such a modification. Indeed, a plurality of pixels are already provided for each sample and hold circuit, and thus Nomura already considered how the required number of circuits in the image pick-up apparatus could be reduced but still does not result in the features of independent claim 12.

Accordingly, Applicant submits that independent claim 12, and dependent claims 13-22 depending therefrom, are allowable over Nomura.

New independent claim 23 is also patentable over Nomura.¹

In Fig. 8 of Nomura, a current stabilizing transistor QB is provided between transistors QD and QA. The gate of the stabilizing transistor QB is permanently connected to the bias voltage VD. In contrast, Fig. 13 of the present application shows second and third switches T₆ and T₇ connected in parallel and switched on and off in the first and second periods, respectively. The features of claim 23 thereby achieve the advantage of isolating node C from the first transistor, reducing unexpected output spikes at a subsequent comparator stage.

Nomura does not address or achieve the above advantage. The arrangement of the features of claim 23 requires only two clock pulses, whereas the arrangement of Fig. 8 of Nomura requires the reset pulse RG, the output pulse OS, the sample and hold pulse SH, and the sensing pulse T₁. Also, the combination of features of claim 23 does not require the gate of the stabilizing transistor QB to be permanently biased. As a result, claim 23 reduces the

¹ Applicant notes that new claim 23 is directed to the embodiment shown in Fig. 10, as modified by Fig. 14. Page 8 of Applicant's specification supports the applicability of this modification ("the circuits described above in relation to figures 5 to 13 can be modified...").

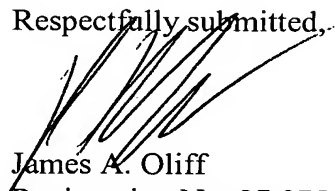
the signal and power requirements, without using additional transistors, as compared to that of Nomura

Applicant thus respectfully submits that new claim 23 is patentable over Nomura.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,


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